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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/819,969	03/28/2001	Masaki Ohya	14458	4222

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EXAMINER

RODRIGUEZ, ARMANDO

ART UNIT	PAPER NUMBER
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2828

DATE MAILED: 06/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n No.

09/819,969

Applicant(s)

OHYA ET AL.

Examiner

Armando Rodriguez

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 February 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 06 March 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 1-13 have been considered but are moot in view of the new ground(s) of rejection.

Double Patenting

Applicant is advised that should claim 1 be found allowable, claim 13 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2,4,6,8 and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Applicant has not define within the claim language the recited range of at least $1 \times 10^{17} \text{cmE-3}$ and no greater than $5 \times 10^{17} \text{cmE-3}$.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwamoto et al (PN 6,487,226) in view of Hatakoshi et al (PN 6,031,858), Tanaka et al (PN 4,961,197) and Honda et al (PN 5,586,136).

Iwamoto et al, Hatakoshi et al, Tanaka et al and Honda et al illustrate semiconductor lasers, which may be used as a self-pulsation AlGaInP semiconductor laser.

Regarding claims 1, 11 and 13,

Iwamoto et al illustrates in figure 1 a semiconductor laser having a cladding layer (2), an active layer (4) with quantum well layers (4a), a cladding layer (6) and a current blocking layer (9). Column 5 line 25 describes the active layer as having three to seven quantum well layers (4a). Column 5 lines 24-25 describe the cladding layer (6) as having a thickness of 0.3 μm . Cladding (6) which has a current blocking structure on the flat portion is described in column 5 lines 9-10 as having an impurity concentration of $1 \times 10^{18} \text{cm}^{-3}$.

Iwamoto et al does not disclose the cladding layer with a current blocking structure on the flat portion as having a carrier density in the range of at least $1 \times 10^{17} \text{cm}^{-3}$ and no greater than $5 \times 10^{17} \text{cm}^{-3}$.

In column 19 lines 4-35 Hatakoshi et al discloses that a cladding layer having a low carrier concentration an overflow of electrons from the active to the cladding layer occurs, where a low carrier concentration is defined as $1 \times 10^{17} \text{cm}^{-3}$. To prevent the overflow of electron Hatakoshi teaches using a carrier blocking or a carrier concentration of $1 \times 10^{17} \text{cm}^{-3}$ or more.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide the cladding layer of Iwamoto et al will a carrier concentration of 1×10^{17} or more because it not require the use of a carrier blocking layer for preventing overflow of electrons from the active layer, as disclosed by Hatakoshi et al.

Regarding claims 2,9,10 and 12,

Iwamoto et al illustrates in figure 1 a semiconductor laser having a cladding layer (2), an active layer (4) with quantum well layers (4a), a cladding layer (6) and a current blocking layer (9). Column 5 line 25 describes the active layer as having three to seven quantum well layers (4a). Column 5 lines 24-25 describe the cladding layer (6) as having a thickness of $0.3 \mu\text{m}$. Cladding (6) which has a current blocking structure on the flat portion is described in column 5 lines 9-10 as having an impurity concentration of $1 \times 10^{18} \text{cm}^{-3}$.

Iwamoto et al does not disclose the semiconductor laser having a refractive index of at least 7×10^{-4} and no greater than 3×10^{-3} .

In column 4 lines 67-68 and column 5 lines 1-4, Tanaka et al discloses a stabilized self sustained pulsation semiconductor may be obtained by controlling the refractive index below the ridge stripe within the range of 8×10^{-4} to 5×10^{-3} .

Therefore, it would have been obvious to a person having ordinary skill in the art to control the refractive index of the Iwamoto et al to within a range of 8×10^{-4} to 5×10^{-3} because it would provide a stabilized self-sustained pulsation semiconductor laser, as disclosed by Tanaka et al.

Iwamoto et al does not disclose the cladding layer with a current blocking structure on the flat portion as having a carrier density of less $3 \times 10^{17} \text{cm}^{-3}$.

In column 19 lines 4-35 Hatakoshi et al discloses that a cladding layer having a low carrier concentration an overflow of electrons from the active to the cladding layer occurs, where a low carrier concentration is defined as $1 \times 10^{17} \text{cm}^{-3}$. To prevent the overflow of electron Hatakoshi teaches using a carrier blocking or a carrier concentration of $1 \times 10^{17} \text{cm}^{-3}$ or more.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide the cladding layer of Iwamoto et al will a carrier concentration of 1×10^{17} or more because it not require the use of a carrier blocking layer for preventing overflow of electrons from the active layer, as disclosed by Hatakoshi et al.

Regarding claims 3 and 4,

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Iwamoto et al discloses the cladding layer composed of AlGaInP, therefore it would have been to use the disclosed composition of AlGaInP because Iwamoto et al discloses that such composition are applicable for self-pulsation semiconductor lasers, see column 11 lines 62-67.

Regarding claims 5-8,

Iwamoto et al illustrates in figure 1 a semiconductor laser having a cladding layer (2), an active layer (4) with quantum well layers (4a), a cladding layer (6) and a current blocking layer (9). Column 5 line 25 describes the active layer as having three to seven quantum well layers (4a). Column 5 lines 24-25 describe the cladding layer (6) as having a thickness of 0.3 μm . Cladding (6) which has a current blocking structure on the flat portion is described in column 5 lines 9-10 as having an impurity concentration of $1 \times 10^{18} \text{cm}^{-3}$.

Iwamoto et al does not disclose the semiconductor laser having a misorientation of 5 degrees or more and compressively strained quantum well layers.

Honda et al discloses misorientation of 9 degrees to 17 degrees of the substrate plane of (001) to [110], as described in column 17 lines 32-44. In column 2 lines 56-65 described the quantum well layers as having a compressive strain. On page 12 lines 25-28 of the specification applicant discloses and implies that the misorientation of the semiconductor laser is not critical to the claimed invention since the claimed invention is capable of operation regardless of the orientation.

However, it would have been obvious at the time the invention was made to provide a misorientation and compressive strain to the semiconductor laser of Iwamoto

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et al because it would improve the operating characteristics of the semiconductor laser as suggested by Honda et al in column 17 lines 6-10.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Armando Rodriguez whose telephone number is (703) 308-6218. The examiner can normally be reached on 10-hour day / M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (703) 308-3098. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7721 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-4881.


Armando Rodriguez
Examiner
Art Unit 2828


Paul Ip
Supervisor
Art Unit 2828

AR/PI
May 31, 2003